[39] **"Recent Advances in Toxicology Relevant to Carcinogenesis: Seven Cameos," F. Roe, *Food and Chemical Toxicology* 31(11): 909-925, 1993**

"I was born and reared in the sulfurous fog of south-east London long before the Clean Air Act. Staying indoors provided me with little protection from air pollutants because only one room in our house was heated. In this small living room my father continuously smoked his pipe, the open fire intermittently delivered its fumes into the room instead of up the chimney, and my grandmother, having unilaterally declared south-east London to be a moth-free zone, sat in a haze of camphorous fumes. I look back in wonder that I both tolerated and survived all these insults to my lungs. By contrast, I am today thoroughly intolerant of intrusive odours and particularly of irritation from other people's tobacco smoke."

"There are many members of the medical profession and of the general public who are so concerned with the strong association between cigarette smoking and lung cancer, that they regard it as justifiable to use any means to stop people from smoking. Among the means presently used is to make statements about the numbers of lung cancer deaths attributable to exposure to environmental tobacco smoke. From a logical viewpoint such calculations are unconvincing, if not ludicrous. Epidemiology is a blunt tool and one that is clearly too blunt to measure a possible small difference in lung cancer between non-smokers married to smokers as compared with non-smokers married to non-smokers. In such groups, one cannot titrate risk against actual measurements of exposure to environmental tobacco smoke over a lifetime since no data for exposure exist, and in none of the 29 analysable studies of this kind was it possible to control reliably for all the other factors known to be important as determinants of lung cancer risk, such as radon, bird-keeping, outdoor air pollution, indoor air pollution, genetic factors, occupational factors and diet. People's statements about their own present and past smoking habits are extremely unreliable. And furthermore, mortality data for lung cancer are grossly unreliable."

"All we know for certain is that environmental tobacco smoke can be irritant to the nose and eyes and aggravate the symptoms of asthma. Whether these short-term effects have more serious long-term consequences has not been established. Unfortunately, the toxicologist has not been able, so far, either to support or refute the claims and counter-claims made in relation to lung cancer risk from environmental tobacco smoke, and decisions concerning the existence and extent of hazards are being made by what is billed as consensus (e.g. EPA, 1992). Some of the biggest mistakes in history have been based on consensus thinking. As pointed out by Skrabanek, consensus should never be regarded as a substitute for scientifically based facts."

Respiratory Diseases and Conditions -- Children

[40] **"Asthma in Gaza Refugee Camp Children and Its Relationship with House Dust Mites," K.Y. Mumcuoglu, Y. Abed, B. Armenios, S. Shaheen, J. Jacobs, S. Bar-Sela, and E. Richter, *Annals of Allergy* 72: 163-166, 1994**

"The aim of the present study was to examine asthmatic children from the Gaza Strip and to compare them with age-sex-neighborhood matched controls, thus assessing the relationship of asthma to external factors such as housing conditions, house dust, smoking habits, and exposure to animals."

"A comparison was made between two groups of children, 300 asthmatic children and 100 controls, similar in age, sex, and neighborhood. There were no noteworthy differences between groups with respect to family history of asthma, social status and education of the parents, child labor and home environment (eg, presence of carpets and curtains in bedroom, types of mattress, and bedding as well as upholstery combinations)."

"The level of smoking in the homes by the occupants, (ie, the number of parents and other siblings who smoked two to six packs of cigarettes per day), was found to be significantly higher in the homes of asthmatic patients versus nonasthmatic controls, 35.4%: 16%, asthmatics: controls, respectively. . . . Eighty-seven percent of the patients were coughing during the day and night; 68% reported wheezing throughout the day; 93% became breathless after physical exercise or playing with other children, but

2046392392

Source: https://www.industrydocuments.ucsf.edu/docs/zrwl0000

there were equally large percentages of smoke free homes among cases and controls."

"Mites were present in all the houses surveyed. Twelve species of mites were identified. From the dust samples of the patients 20 to 3,800 mites (mean = 447) per gram dust were isolated. In dust samples from the control group 40 to 2,040 mites (mean = 399) per gm dust were counted."

"In the Gaza Strip in 98% of the patients the allergic symptoms became worse after exposure to house dust. In 97% of the cases the symptoms were more severe at home. . . . High numbers of house dust mites were found in Gaza. All these facts indicate that house dust and house dust mites are probably important allergens in this region."

"Crowded living conditions, the type of bedding and cleaning methods of the population also contribute to the prevalence of mites in the homes. For bedding, inhabitants use several layers of blankets that are covered with plastic during the day. Houses are cleaned with brooms as well as with dry and wet mops. These methods are less effective than vacuum cleaners would be in the elimination of mites."

"Most of the children in Gaza are exposed to a high number of mites in their homes throughout the year, however, it appears that those who are genetically predisposed to asthma as well as those who are possibly exposed to household tobacco smoke are at greater risk for developing asthmatic symptoms."

ETS Exposure and Monitoring

[41] "Gas/Particle Partitioning of Polycyclic Aromatic Hydrocarbons and Alkanes to Environmental Tobacco Smoke," J.F. Pankow, L.M. Isabelle, D.A. Buchholz, W. Luo, and B.D. Reeves, *Environmental Science and Technology* 28: 363-365, 1994

"Since environmental tobacco smoke (ETS) has been implicated as a cause of human cancer, there is a need to understand the physical-chemical behavior of the carcinogenic and toxic organic compounds present in ETS. These compounds include the polycyclic aromatic hydrocarbons (PAHs) and a variety of substituted PAHs. One very important physical-chemical process governing the behavior of organic compounds in air is partitioning between the gas and aerosol particulate phases. Such gas/particle (G/P) partitioning determines the distribution of a given compound between the gas and particulate phases. . . . [S]emivolatile organic compounds (SOCs) (which include many of the PAHs and substituted PAHs) are of special interest in the G/P partitioning context because their intermediate volatilities permit them to be present to significant degrees in both phases. Volatile compounds (e.g., benzene) are usually almost exclusively in the gas phase, and low-volatility organic compounds are usually almost exclusively in the particulate phase."

"Understanding G/P partitioning for ETS is important because dose/response relationships are strongly related to the physical forms in which the compounds are present when exposure occurs. Although a fair amount is known about the composition of ETS, there has been little study of G/P partitioning in indoor air contaminated with ETS. As a result, currently available epidemiologic studies on the effects of ETS do not have adequate dose/response documentation. In addition to affecting compound toxicity, G/P partitioning is important in predicting the (1) behavior of tracers used to apportion indoor air pollution among the different possible sources; (2) deposition of gases and particles on indoor surfaces in models of indoor air quality; and (3) effectiveness of air filters and electrostatic particle precipitators in removing air toxics from indoor air."

"Sampling was carried out at a local business that provides a form of social recreation. Fire regulations limit occupancy in the [approximately] 38 m by 33 m by 5 m high hall to about 300 people at any one time; 200 people are commonly present, with perhaps 30% smoking at any one time. A smoky, blue haze is often clearly visible in the air. Beside tobacco smoke, no other significant forms of indoor air pollution were apparent in the hall. Although some grilling of food occurs, the cooking area is quite small and is vented. The overall building ventilation allows the air to become substantially cleaner within about 1 h after the patrons leave. Therefore, the samples taken may be considered to be 'fresh' rather than 'aged' ETS."

2046362393

Source: https://www.industrydocuments.ucsf.edu/docs/zrwl0000

"[P]redictive G/P partitioning calculations can be made for organic compounds in indoor air contaminated with ETS. Much-improved compound-dependent dose estimates that differentiate between the gaseous and particle-associated fractions can therefore be incorporated into studies of human exposure to ETS."

[42] **"Sidestream Cigarette Smoke Generation and Exposure System from Environmental Tobacco Smoke Studies," S.V. Teague, K.E. Pinkerton, M. Goldsmith, A. Gebremichael, S. Chang, R.A. Jenkins, and J.H. Moneyhun, *Inhalation Toxicology* 6: 79-93, 1994**

"[M]achine-generated sidestream cigarette smoke can be used to examine the health effects associated with ETS exposure. Indeed, a number of studies have used aged and diluted sidestream smoke (ADSS) to simulate ETS exposure conditions. However, generating ADSS is not a simple process, particularly for small exposure chambers."

"The purpose of our study was to design and fabricate a sidestream cigarette smoking system for small chambers that (1) could reliably generate a controlled range of exposure conditions over a desired length of time, (2) was less expensive to build and operate than existing systems, and (3) required less manual intervention than existing systems. Toward these goals we developed an entirely automated cigarette handling and smoking system that generates aged and diluted sidestream smoke under precisely defined conditions for the smoking of cigarettes. We also developed a conditioning chamber to collect, mix, and age the smoke, from which a portion of the smoke could be further diluted and drawn into exposure chambers to approximate environmentally relevant conditions. Finally, we describe methods to monitor total suspended particulate (TSP), carbon monoxide (CO), and nicotine concentrations within the exposure system."

"Our smoke generation and exposure system is composed of four major components. The first is an automated device for loading, lighting, and smoking cigarettes. This device ensures uniform smoking of each cigarette under identical conditions. The second component is a dilution chimney, which collects and transfers smoke from the burning end of a smoldering cigarette to the third component, the conditioning chamber. The conditioning chamber is used to dilute and mix the smoke with filtered air until the desired concentration is achieved. Together, these three components constitute the smoke generation portion of the system. The final component of our system consists of chambers for the exposure of animals or cells to aged and diluted sidestream smoke."

"As can be seen from our component descriptions, our smoke generation and exposure system can be assembled from readily available equipment. Existing equipment may also be used . . . thus making it possible to construct a smoke generating and delivery system even with a modest budget. In addition, a variety of configurations is possible while adhering to the central principle of a single smoke-conditioning chamber connected to one or more exposure chambers."

"Our results demonstrate that our sidestream smoke generation and exposure system is capable of generating and delivering environmentally relevant ADSS. The system was designed to allow great flexibility in selecting exposure concentrations. With our system we can simultaneously generate different TSP concentrations in each exposure chamber simply by adjusting air flow between the conditioning and the exposure chambers within a very tight range. In preliminary studies, we have set chamber TSP concentrations at 100, 500, 1000, and 3000 ug/m^3 and maintained these concentrations constant for 6 h/day. It is interesting to note that CO and nicotine concentrations under these same TSP concentrations have also been consistent with values of 0, 0, 6, and 15 ppm for CO and 10, 120, 400 and 1200 ug/m^3 for nicotine, respectively (unpublished observations)."

"It was during these and other preliminary studies that we noticed an interesting trend in nicotine concentration during exposures: The nicotine level in the animal chambers gradually increased. . . . To minimize this confounding factor, we thoroughly clean the chambers weekly to remove all accumulated smoke constituents."

"In addition to nicotine, a number of other vapor-phase constituents can be measured in ADSS. The relative concentrations of these constituents in our exposure system are similar to those reported by other

2046362394

Source: https://www.industrydocuments.ucsf.edu/docs/zrwl0000

investigators. This similarity suggests that the composition of ADSS is not radically different from ETS encountered in real-life environments, with the obvious exception of nicotine."

"Because we have found that the presence of cages and bedding does not affect the concentration or delivery of the ADSS, we feel that whole-body exposures are entirely appropriate."

"Finally, our automated device for handling and smoking cigarettes significantly reduces the labor involved in performing ETS exposures and increases the consistency of smoke exposure concentrations. Because an operator no longer has to physically manipulate and light each cigarette, he or she is free to do other tasks. More importantly, the operator is free from inadvertent exposure to the very substances being investigated."

INDOOR AIR QUALITY

[43] **"Personal NO_2 Exposure Monitoring Shows High Exposure Among Ice-Skating Schoolchildren,"** M. Berglund, L. Braback, G. Bylin, J.-O. Jonson, and M. Vahter, *Archives of Environmental Health* 49: 17-24, 1994

"The main objectives of this study were to test a method for measuring personal NO_2 exposure among school children and to study their activity patterns and personal exposure to NO_2 in relation to urban and rural living. The results of the first study week indicated remarkably high NO_2 exposure levels among ice skating school children, which led to a follow-up exposure study during an ice hockey tournament for schoolchildren."

"Personal exposure to NO_2 was measured among fifth-grade schoolchildren (about 12 y of age) in two school classes: one in the urban area of Sundsvall (23 children); and one in a rural area (30 children), outside Sundsvall. . . . A passive sampler was used to measure NO_2 concentrations. . . . The samplers were attached to the clothes close to the breathing zone. One-week samples were collected indoors and outdoors at both the homes (bedroom) and the schools (classroom) of the children."

"Half of the households in the rural area and one quarter of the households in the urban area included smokers. No influence on the personal NO_2 exposure levels from passive smoking could be identified, and there were no significant differences in indoor NO_2 levels between homes including smokers or not. Some of the households occasionally used wood for heating (vented systems) or used the open fireplace, but no influence on indoor or personal exposure levels could be detected."

"Overall, the NO_2 levels measured during the ice hockey tournament were very high in the unventilated indoor ice-skating arenas studied, but were highest in the newly built arena, which like most houses build after the energy crisis during the 1970s, lacks natural ventilation. The NO_2 concentrations were measured at the rink side and the gallery, 4 m above the ice, twice a day, and by the ice hockey playing children during different ventilation conditions. . . . When the arenas were ventilated with fresh air, 100% for 24 h and 50% for the next 24 h, the NO_2 level outside the buildings, measured at the air inlet, was 23 ug NO_2/m^3 during the study period. The staff, operating the ice resurfacing machine in both arenas, had exposure levels between 39 and 3256 ug NO_2/m^3."

"The 24-h NO_2 exposure levels measured in the urban group of children were low, compared with levels measured at the air monitoring station."

"Evaluation of the activity records revealed that visits to the downtown area (at the base of the valley), where the ambient NO_2 levels were most likely the highest, only sometimes resulted in slightly increased 24-h average exposures."

"Cigarette smoke seems to be of minor importance as a source of NO_2 exposure for nonsmokers."

"Indoor NO_2 concentrations reflect outdoor air concentrations when no indoor sources are present."

"Visits to the indoor ice-skating arenas gave rise to extremely high NO_2 exposure levels, by far exceeding the median daily exposure. The use of ice resurfacing machines that run on propane gas in combination with poor ventilation resulted in average NO_2 levels up to 60 times the 24-h Swedish standard for ambient air, and almost 2 times the 8-h occupational exposure limit for NO_2 from motor combustion exhausts (2,000 ug/

2046362395

Source: https://www.industrydocuments.ucsf.edu/docs/zrwl0000

m^3). . . . It should be noted that the ice resurfacing machine was run properly."

"The children were fully capable of handling the samplers and the time-activity diaries with the help from their teachers. Previous NO_2 measurements at the urban air monitoring station in the center of the town indicate that children in urban Sundsvall have been supposed to be exposed to NO_2 concentrations that are among the highest in Sweden. This is not supported by the present study. The present study shows that the NO_2 concentrations measured at the air monitoring station are not representative for the children's exposure. In general, the personal NO_2 exposure levels were low, both for children in the urban areas and in the rural areas. Exposure to outdoor air NO_2, as well as to NO_2 from cigarette smoke, seemed to be of little importance."

Statistics and Risk Assessment

[44] **"Science, Policy, and Ethics: The Case of Environmental Tobacco Smoke," (Variance and Dissent: Presentation), G.B. Gori, *Journal of Clinical Epidemiology* 47(4): 325-334, 1994**

"Public health agencies and scientists adverse to ETS have published complex technical assessments of ETS studies, culminating recently with a report by the U.S. Environmental Protection Agency. Most of these assessment[s] and studies are enigmatic to laymen or the lay press, and are presented as grounded in scientific certainty. They have resulted in official public warnings that ETS is a risk factor for lung cancer, cardiovascular, and respiratory diseases, despite manifest internal contradictions."

"The case of ETS is but one signal example of forced policy, brought here to illustrate a point. . . . Because an itemized examination of the vast ETS literature would be cumbersome, this essay will take advantage of recent studies and reviews that distill data and critiques from previous years. Their analyses will cover the major issues: the comparison of main-stream smoke and ETS; whether exposures to the extreme dilutions of ETS could pose conceivable risks; specificity, sensitivity, and confounding issues in the interpretation of epidemiologic data; and the role of ETS in subjective and objective perceptions of indoor air quality."

"In the interest of full disclosure, readers should know that the author has received occasional support from tobacco interests. Nevertheless, this essay strives to present evidence for what it is, not for what anyone may wish it could be. Most of the studies to be cited were supported by public funds, issued by official agencies, or written by opponents of ETS. As we shall see, these studies have internal contradictions; they endorse policies adverse to ETS while revealing and even admitting a persistent lack of scientific support."

"Unfortunately, policies today are being founded on preconceived and pliant hypotheses rather than on established knowledge. Worse still, hypotheses are being represented as firm scientific understanding. The ensuing moral dilemma extends beyond the ETS issue: Do presumably good intentions grant the freedom to impose speculative inference as scientific knowledge upon a trusting public?"

"Nominally, then, ETS and main-stream smoke may share some components, but their chemical and physical differences are substantial. Moreover, the presence of most ETS components can only be postulated because they are beyond material detection. The available evidence offers some limited opportunities to gauge ETS exposures and doses in relation to active main-stream smoking counterparts."

"Overall, these considerations lead to the conclusion that the prevalent ETS-RSP dose is minuscule. Although difficult to define, it is between 10,000 and 100,000 times smaller than the main-stream smoke dose in active smokers, as official EPA reports acknowledge. For the average ETS-exposed individual, this estimate translates into an annual dose equivalent to considerably less than the main-stream RSP of one cigarette."

"Documented observations -- also plainly perceived in everyone's life and experience -- indicate that people have innate capacities to cope with multiple low-level exposures. The question, then, is whether very small doses of ETS are plausible risks in non-smokers."

"[P]revalent ETS exposures equivalent to less than the active smoking of one cigarette per year are thousands of times below exposures that result in no significant health risks."

2046362396

Source: https://www.industrydocuments.ucsf.edu/docs/zrwl0000

"Altogether, considerations of exposure and dose are not sufficient to infer that ETS could pose ponderable health risks, even assuming that ETS may be chemically and biologically equivalent to main-stream smoke. Hence, the weakness of the exposure-dose argument has prompted attempts to estimate possible ETS-linked health risks directly from epidemiologic studies."

"Weak ETS exposures suggest that epidemiologic studies would at best produce weak risk associations."

"[M]ost of the reports are not statistically significant, several report no risk at all, and the majority are compatible with interpretations suggesting protective effects of ETS exposure. Straightforward logic considerations would accord much significance to studies reporting null or protective effects in the presence of ETS exposure -- at the very least they are strong evidence that factors other than ETS are likely operational in positive studies."

"[A]ttributions of epidemiologic risk to ETS cannot be rationally sustained unless confounders and biases have been convincingly controlled, and adjustments have been objectively justified. Unfortunately, an accurate control of potential confounders and classification biases is probably beyond technical feasibility. ETS epidemiologic studies in general may not hold sufficient promise as profitable investments of scarce research funds. Simply stated, epidemiologic analysis may not be sensitive and specific enough to justify ETS investigations."

"Because of the weakness of epidemiologic inferences of ETS risk, opponents have successfully attempted to portray ETS as a major sensory and esthetic aggravation. Here, however, the intent to establish a cultural aversion is more event than its circumstantial justifications."

"As we shall see next, ETS is a relatively minor contributor to environmental irritants and odors. The major sources of such nuisances derive from new construction technologies, materials, equipment, and tools, as shown by detailed studies of indoor air quality and of what is known as the 'sick building syndrome.'"

"Overall, the collective evidence suggests that ETS remains a relatively minor issue in indoor air quality."

"Evolving policies opposed to ETS are being justified along two lines. One takes the moral high ground, and is the assumption that ETS is even more unnecessary than active smoking. The other alleges support from science. While there can be no argument that tobacco smoking and ETS are of legitimate public health interest, the moral assumption would require a separate discussion, quite beyond the bounds of this paper. On the second issue, the evidence does not substantiate claims of scientific support."

"One can only conclude that official and unofficial estimates of ETS health risks are based on weak, contradictory, and selective arguments. These artful manipulations of the evidence deviate from precepts of scientific conduct endorsed by universal consensus, and would bring swift charges of misconduct to any individual scientist or academic institution. Yet, agencies seem to do it with impunity, by asserting official prerogatives."

"Confronted with this lack of scientific support, policymakers traditionally invoke a duty to be prudent. This stance, however, raises two main questions. One is about the limits of prudence, given intuitively that unlimited prudence is ruinous. The second asks to what extent policies can allege scientific support when support is not available. In principle, the answer should be a clear negative. In practice, an authoritarian tradition still claims paternalistic prerogatives. Ultimately, the answer will reflect the civic and cultural maturity of a nation. Can a truly free society survive if it tolerates deception for any reason in its governing policies?"

STATISTICS AND RISK ASSESSMENT

[45] "Environmental Tobacco Smoke: A Public Health Conspiracy? A Dissenting View," (Dissent A), W. Farland, S. Bayard, and J. Jinot, *Journal of Clinical Epidemiology* 47(4): 335-337, 1994

"In the preceding article, Gori has chosen to present the case for health risks of environmental tobacco smoke (ETS) as speculative and unscientific, as driven by well-intentioned policy, and as yet another indication of unethical behavior by scientists. As three of the scientists responsible for the centrally discussed EPA

2046362397

Source: https://www.industrydocuments.ucsf.edu/docs/zrwl0000

report on ETS, we take great exception to this characterization and, in brief fashion, provide an alternative and dissenting view."

"Our position on the respiratory health effects of exposure to ETS is explicitly and thoroughly discussed in the 530-page EPA report, which is strictly an assessment of the scientific evidence and contains no regulatory policy. . . . [W]e think it is important that readers considering Gori's views of the 'speculative' nature of health risk assessments keep several facts in mind:"

"Risk assessment requires scientific judgment and inference in the absence of definitive scientific evidence. . . . While this approach carries some uncertainty, confidence in hazard and risk predictions increases as both direct and indirect data from humans become available for assessment."

"Few chemicals or environmental pollutants have a data base as extensive as that of ETS for the assessment of cancer and noncancer effects. The information base for ETS is extraordinarily large and contains substantial evidence from actual human studies, including evidence by analogy with active smoking and direct evidence of ETS effects. . . . [T]he direct human evidence of ETS effects is from exposure to typical environmental levels."

"A 'weight-of-evidence' approach to the assessment of the respiratory effects of ETS relies on a detailed review of individual studies but, more importantly, on a reasoned evaluation of the total body of evidence. The EPA's characterization of the lung cancer hazard of ETS is based on the well-documented risks of lung cancer from active smoking *plus* the similarities between 'active' and 'passive' smoke *plus* results from laboratory studies *plus* evidence from 30 epidemiology studies of ETS and lung cancer in never-smokers. . . . For the biostatistician or epidemiologist evaluating a large data base, this multi-test, multilevel analysis would be better characterized as rigorous than as 'tortuous and implausible' as Gori alleges."

"The final report is a result of Review and Consensus, not Conspiracy."

"The methodologies and conclusions in the EPA report were subjected to extensive peer review and received strong consensus support from a committee of 18 independent scientists. Gori's essay would have us believe that this support was merely based on a lack of scientific credibility in our reviewers who would sacrifice, to a person, their own integrity for the sake of advancing public health policy, or maintaining funding for their work. We contend that that truly represents an example of tortuous and implausible thinking."

"Having challenged the science behind any concern for the respiratory effects of ETS, Gori further suggest such a conspiracy, for which he presents no evidence. He claims it is a case of policy driving science and accuses the general scientific community not only of allowing it to occur but of supporting it."

"To challenge risk management decisions by federal, state, or local officials simply on the basis of the available science is naive. To suggest that these are a product of a broad-based conspiracy of unethical public health scientists is absurd."

"Gori drives this point further to suggest that we and others in our field are guilty of scientific misconduct, perhaps, he suggests, even 'hard-core fraud.' Since the respiratory health effects of ETS have been recognized by both government . . . and nongovernment scientists . . . the numbers of scientists involved in this alleged conspiracy to defraud the 'trusting public' must be large. In fact, this conspiracy must extend even beyond our borders, since many of the studies showing adverse effects are from other countries."

"To defend ourselves against Gori's accusations of fraud becomes impossible under Gori's depiction, because he includes as co-conspirators everyone who agrees with us. We can only, as we do above, expose his argument as preposterous, and wonder whether, as a consultant who has long received 'occasional support from tobacco interests,' Gori can really be objective on this issue."

"We believe that the EPA analysis of ETS belies Gori's conclusion of misuse of science. The EPA report (which took 4 years to complete) intensively assesses the evidence on the respiratory effects of ETS. . . . The assessment was developed thorough a deliberate, extensive, and open process of presentation and scientific review. Its conclusions are based on the weight of all the evidence and are widely endorsed by independent scientific experts and organizations. Gori, in his attempt to discredit the report, must resort to

2046362398

Source: https://www.industrydocuments.ucsf.edu/docs/zrwl0000

innuendo and unsubstantiated accusations of a broad-based conspiracy. We believe the evidence and the report speak for themselves."

[46] **"Respiratory Health Effects of Passive Smoking: EPA's Weight-of-Evidence Analysis," (Dissent B), J. Jinot and S. Bayard, *Journal of Clinical Epidemiology* 47(4): 339-349, 1994**

"The EPA is solely concerned with involuntary, or environmental, exposures to tobacco smoke, and has not been involved in Gori's so-called 'campaign against smoking'. Contrary to Gori's allegations, the EPA conducted an objective, scientific assessment, independent of any policy considerations. In fact, the EPA does not have the authority to regulate ETS, merely to provide information and guidance. The 'intentions' of the EPA in performing this risk assessment were to evaluate the risks to respiratory health from exposure to ETS, a major indoor air pollutant."

"The final EPA report incorporates public comments and recommendations from the SAB."

"This article summarizes the analyses presented in the EPA report and responds to criticisms raised by Gio Gori in his accompanying piece. The results of several new studies on ETS and respiratory effects that have been published since the literature cutoff date for inclusion in the EPA report are also described."

"[T]he EPA considers SS, ETS, and MS to be chemically similar for the purposes of qualitative hazard identification of toxic potential."

"Gori . . . suggests that the average ETS-exposed individual receives ETS doses equivalent to less than the active smoking of one cigarette per year, citing one of his previous papers. This estimate is based on selected assumptions relating to exposures to respirable suspended particles (RSPs) and particle retention."

"Gori states, without elaboration, that dose estimates (cigarette-equivalents) based on body cotinine measurements depend on 'assumptions of unlikely validity'. He fails to explain why these dose estimates should be considered any more speculative than those based on any other marker compound, or why ambient exposure levels should 'command' more 'credibility' as a basis for *dose* estimates than actual body measurements."

"Clearly, there are considerable uncertainties in attempting to quantitatively estimate risks to nonsmokers from ETS exposure based on the extrapolation of risks from active smoking. For this reason, the EPA concluded that the data from active smoking are more appropriate for qualitative hazard identification than for quantitative dose-response assessment and risk estimation."

"Gori also contends that there may be a 'threshold' exposure level for active smoking, below which smokers, and therefore passive smokers as well, are not at increased risk of health effects, again citing his 1991 paper. There he estimates, 'without undue claim of precision', the maximum number of cigarettes smoked per day yielding a lung cancer risk not 'significantly' increased from the risk to nonsmokers. While various models could fit the data, Gori bases his estimates on a quadratic model, which generates lower relative risk estimates at low doses than other possible models. Furthermore, he defines his 'threshold' as the modeled cigarette consumption value at which the lower ground of the 95% confidence interval of the estimated activity risk was unity. This is a grossly stringent statistical criterion for a toxic mixture with acknowledged biological effects at incrementally larger doses. Nevertheless, even by Gori's own calculations, designed to facilitate the appearance of a 'threshold', two of the eight prospective active smoking studies yield estimates of less than one cigarette per day as the maximum possible threshold level."

"Gori also claims that MS 'may act as a weak promoter rather than as an initiator.' The scientific evidence, however, suggests that MS has both initiating and promoting potential."

"The EPA's conclusion that ETS is a Group A (known human) carcinogen is based on the total weight of evidence in accordance with the EPA's guidelines for carcinogen risk assessment. This evidence includes:

1. the dose-related association between active smoking and lung cancer down to low doses, with no evidence of a threshold;
2. the qualitative similarities between ETS and mainstream smoke (MS);

2046362399

Source: https://www.industrydocuments.ucsf.edu/docs/zrwl0000

3. supporting evidence of the carcinogenicity of MS and ETS from animal bioassays and genotoxicity studies;
4. measurable ETS exposure and uptake of ETS constituents by nonsmokers; and
5. the results of 30 epidemiology studies investigating ETS exposure and lung cancer in nonsmokers."

"Some of the studies also provide data on males, and some provide data for workplace exposures or childhood exposures: however, these data comprise much smaller databases and were considered to represent poorer indices of ETS exposure than spousal smoking. IN addition to contributing more exposure, home exposures tend to be more stable over time than workplace exposures, since people frequently change jobs, offices, or co-workers. Furthermore, workplace exposures may not be well ascertained by questionnaires, since workers may not be aware of exposures occurring through ventilation systems. . . . Of the 10 studies in the EPA report which attempted to investigate lung cancer and workplace ETS exposures, only two discussed levels of exposure."

"Examining only the highest exposure subgroup of the total 'ever exposed' group provides a better measure of the effect of spousal exposure by reducing exposure misclassification. *ALL* 127 studies with data by exposure level demonstrated an increased risk of lung cancer in the highest exposure group, and 9 of the 17 were statistically significant (probability <1 in 10 million), despite most having small sample size. Also compelling is the fact that 10 of the 14 studies which provided sufficient data for a trend test showed a statistically significant exposure-response relationship (probability <1 in a billion)."

"Several epidemiology studies on ETS and lung cancer have been published since the cutoff date for inclusion in the EPA report, and these studies are all consistent with the EPA's conclusions. While none of them are statistically significant for the crude spousal smoking surrogate, all three show a statistically significant increased risk in the highest exposure group, and two show statistically significant exposure-response trends."

"While Gori has questioned the EPA's use of a one-tailed statistical significance test, the EPA feels that such use was totally warranted in this situation due to *a priori* knowledge of the positive, dose-related associations between active smoking and lung cancer and the qualitative similarities between MS and ETS. In the case of the noncancer respiratory effects, where such *a priori* knowledge from active smoking was not available, a two-tailed test was used. Furthermore, the EPA's conclusions are not dependent on the use of a one-tailed vs a two-tailed test. Given the total weight of evidence and the consistency of responses across numerous epidemiology studies on ETS (e.g. increased risks in the highest exposure groups and exposure-response trends), we have much more confidence in the conclusion of a causal association between ETS and lung cancer than is reflected by the level of statistical significance of individual studies."

"Gori argues that only for increased incidence of respiratory symptoms in infants do some studies find 'a small but statistically significant association' with parental smoking, but he suggests that the association could be explained by other factors. However, he presents no analysis to support this speculation. The EPA report did consider the possible role of several potential confounding factors."

"Gori also concludes that 'ETS does not seem to be a factor in childhood asthma', but again offers no analysis to support that conclusion."

"Gori contends that the EPA's findings are 'artful manipulations of the evidence' which 'would bring swift charges of misconduct to any individual scientist or academic institution' and are merely part of a widespread campaign against smoking. As co-authors of the EPA report, we wish to express our indignation at his personal attacks, but we feel that they say more about him than they do about us. In any event, we maintain that the EPA conclusions accurately reflect the total weight of evidence, and these conclusions have been widely endorsed by independent experts and are consistent with the findings of other agencies and institutions."

[47] "Reply to the Preceding Dissents," (Response), G.B. Gori, *Journal of Clinical Epidemiology* 47(4): 351-353, 1994

"In this issue . . . the dissenting views of Farland et al. and Jinot and Bayard offer essentially the same techni-

2046362400

Source: https://www.industrydocuments.ucsf.edu/docs/zrwl0000

cal arguments presented in the EPA report on ETS, many of which are addressed in my article in this same issue of the journal. I do not see the point of belaboring these matters again, save to highlight the insistence of these authors on the authority of 'consensus' rather than on the scientific clarity of the data."

"Published reports indicate that between 2 and 10% -- average 4-5% -- of self-declared nonsmokers are in fact smokers. For this bias, the EPA review used a 1.09% correction factor to reach a lung cancer risk estimate of 1.19. Including the two latest studies explicitly excluded from the EPA's review and using the EPA's own procedure, a realistic correction factor of only 2.5% would nullify any excess risk estimates in the meta-analysis of the 13 available U.S. studies of spousal exposure. With this example, I do not wish to endorse the EPA model nor to support an absence of risk, but simply to show how volatile conclusions can be."

"Science has no illusions about finding absolute verifications in empirical observations and measurements. Even with this limitation, however, science has had a distinctive success in reaching predictive inferences of cause and effect, after adopting certain rational rules of evidence."

"Epidemiologic studies of multifactorial diseases and low-level exposures raise too many questions of scientific method. These studies resist satisfactory replication [and] are subject to generally uncontrollable biases and confounders."

"They include fundamental issues of method and lead to the inescapable conclusion that -- from a scientific stance -- such epidemiologic investigations regularly produce orphan hypotheses in search of verification."

"Official criteria used to produce 'verification' in these instances are not scientific criteria that survive rational scrutiny, but are born of perceived demands for 'prudent' public health action."

"If, for 'prudent' reasons, the EPA declared ETS to be a group A carcinogen as an *a priori* assumption, why bother to thrash around a database that is incapable of producing an objective scientific verification of the claim? Why broadcast with arguable precision 3060 excess lung cancers a year, apparently flouting the recommendations of the EPA's Science Advisory Board?"

"Farland et al. suggest that I have delusions of a widespread conspiracy. I wish it were so. A conspiracy is something secret and deceitful that when exposed could be quelled with dispatch. What we are witnessing is more worrisome. It is an open and officially endorsed operational mindset where no one can be personally blamed because it has become a common cultural medium, a flawed and hopefully transitional 'research program.'"

"In risk assessment, regulators should be required to address only risks that can be objectively documented by criteria of scientific evidence that are independently justified by their own rationality. Regulators should not be allowed to define their own rules of evidence based on dialectical equivocation."

"Where risks can be objectively identified, cost-benefit evaluations still should be required to insure that regulatory costs do not exceed potential benefits. Only then should political issues enter in the final management of risks."

"Consideration should be given to fund scientific research through public agencies without regulatory interests, so that the recipients of funds may not be influenced their work. This could go a long way in restoring genuine scientific principles in research and teaching."

"Finally, the scientific community must shoulder the task of exposure in pseudo-science wherever it occurs, as a necessary action in defending the image of science and in securing its continuous service in the betterment of the human condition."

2046362401

Source: https://www.industrydocuments.ucsf.edu/docs/zrwl0000

APPENDIX B

UPCOMING SCIENTIFIC MEETINGS

• **May 17-20, 1994**
Twelfth Summer Institute in Risk Management in Environmental Health and Protection, New York University, New York, New York [Issue 71. Item 35]

• **May 21-25, 1994**
American Thoracic Society/American Lung Association International Conference, Boston, Massachusetts [Issue 71, Item 36]

• **May 22, 1994**
Indoor Air Quality Symposium, American Industrial Hygiene Conference and Exposition, Anaheim, California [Issue 57, Item 34]

• **May 30-June 3, 1994**
Conference on Microfungi and Their Role in IAQ, Ottawa, Canada [Issue 68, Item 24]

• **June 17, 1994**
Indoor Air Quality: An Overview for People Who Need to Know, AIHHM, Oklahoma City, Oklahoma [Issue 57, Item 35] Same program to be held July 14, 1994, Anchorage, Alaska

• **August 22-25, 1994**
Healthy Buildings '94, Budapest, Hungary [Issue 63, Item 26]

• **September 7, 1994**
One-Day IAQ Course, Environmental Law and Policy Program, George Washington University, Washington, D.C. [Issue 63, Item 25]

• **October 6-8, 1994**
Healthy Indoor Air '94, Anacapri, Italy [Issue 68, Item 25]

• **October 10-14, 1994**
9th World Conference on Tobacco and Health, Paris, France [Issue 60, Item 38]

• **October 18-20, 1994**
Indoor Air Quality in Asia, Beijing, China [Issue 54, Item 42]

• **October 30-November 2, 1994**
IAQ '94: Engineering Indoor Environments, ASHRAE and other sponsors, St. Louis, Missouri [Issue 58, Item 42]

• **November 27-December 1, 1994**
Indoor Air: An Integrated Approach, EPA and other sponsors, Gold Coast, Australia [In This Issue]

2046362402

Source: https://www.industrydocuments.ucsf.edu/docs/zrwl0000